

CLAIMS

What is claimed is:

1. An apparatus comprising:
a flow manager;
a remote logical port (RLP) model to model a remote physical
port (RPP); and
a trunk scheduler to schedule transmission units direct to the
remote physical port.
2. The apparatus of claim 1 wherein the flow manager comprises:
a flow shaper; and
a flow parameter database.
3. The apparatus of claim 1 wherein the flow manager comprises:
a discard policy that is able to differentiate between the discard
rates of at least two flows; and
a flow parameter database.
4. The apparatus of claim 1 wherein the flow manager comprises:
an RLP scheduler; and
a flow parameter database.
5. The apparatus of claim 2 wherein the flow manager further
comprises:
an RLP scheduler.
6. The apparatus of claim 1 wherein the RLP model comprises:
an RLP data structure to hold data indicating characteristics of the
RPP; and
an RLP traffic shaper to make a transmission unit eligible
consistent with the characteristics of the RPP.

7. The apparatus of claim 5 wherein the flow manager comprises a plurality of queues, one queue for each flow directed toward the RPP.

5 8. The apparatus of claim 7 wherein shaping and scheduling are performed by manipulating pointers to the queues.

9. The apparatus of claim 1 wherein the trunk scheduler statistically multiplexes an aggregate of the flows directed to a plurality of RPPs.

10 10. The apparatus of claim 1 wherein the trunk scheduler operates in a weighted round robin non-work conserving manner.

11. The apparatus of claim 1 further comprising one of an OC-3 port
15 and a DS-3 port.

12. A system comprising:
a broadband communication link;
a demultiplexer coupled to a plurality of physical ports and the
20 broadband communication link; and
a network element coupled to the communication link, the network element modeling the plurality of physical ports and providing a two-tier hierarchy of shaping and scheduling of flows directed to the plurality of physical ports.

25 13. The system of claim 12 wherein the network element comprises:
a first flow shaper to shape a plurality of flows directed to a remote physical port (RPP);
a first scheduler to schedule the flows shaped by the first flow
30 shaper to yield a scheduled flow;
a second flow shaper to shape the scheduled flow; and
a trunk scheduler to schedule the flow shaped by the second flow shaper for transmission to the RPP.

14. The system of claim 12 further comprising:
a plurality of data structures populated with data indicating
characteristics of a remote physical port (RPP); and
5 a database populated with flow parameters.

15. The system of claim 14 wherein a one-to-one correspondence
exists between RLP data structures and RPPs.

10 16. The system of claim 13 wherein the network element comprises:
a queue for each flow directed at a physical port and wherein
shaping and scheduling are performed by pointer manipulation.

15 17. A method comprising:
modeling a plurality of remote physical ports (RPP) as a plurality
of remote logical ports (RLP); and
reflecting quality of service from a control aggregator to the
plurality of RPPs.

20 18. The method of claim 17 wherein reflecting comprises:
shaping a plurality of flows directed to a RPP into a plurality of
shaped flows;
scheduling the shaped flow into a scheduled flow;
shaping the scheduled flow into a shaped scheduled flow; and
25 scheduling the shaped scheduled flow for transmission to the
RPP.

19. The method of claim 17 wherein modeling comprises:
populating a database with an entry indicating an ability of an
30 RPP to transmit data.

20. The method of claim 19 wherein modeling further comprises:
creating a data structure for each flow directed to a remote
physical port; and

manipulating the data structure to indicate eligibility of a
5 transmission unit consistent with the ability of the RPP to transmit data.

21. The method of claim 17 further comprising:
statistically multiplexing the flows from the plurality of RLPs to
the plurality of RPPs.

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22. The method of claim 17 wherein a one-to-one correspondence
exists between the RLPs and the RPPs.

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